

PRINTER CARTRIDGE COMPATIBLE WITH PRINthead

CROSS REFERENCE TO RELATED APPLICATION

This application claims priority from provisional patent application no. 60/219,169 filed July 19, 2000, the contents of which are incorporated by reference.

BACKGROUND

The invention relates to the filed of ink printers, and more particularly to a cartridge that is compatible with a particular type of printhead.

It is well known and indeed the universal practice to have ink printers such as are commonly used with personal computers (PC) equipped with replaceable cartridges that store the ink that is used with printers. The cartridges are replaceable so that when the ink supply in a particular cartridge is exhausted, the user need simply the replace the spent cartridge with a new cartridge having ink to continue operation of the printer. It is also well known to have 2 separate cartridges: one storing black ink and the other storing the three primary colors. Because users typically use much more black ink than color ink (or in any event, use black ink at a different rate than color ink), it is advantageous to have the black ink cartridge separately replaceable to avoid wasting ink when a cartridge is replaced.

The present invention relates solely to the mechanical fit of an ink cartridge with a particular type of printhead as described below, and the remaining portions of the ink cartridge can be constructed in way that is desired by a manufacturer, as is well known in the art.

SUMMARY

The present invention relates to a printer cartridge that is compatible with a particular printhead, such as a printhead as described in United States Patent No. 5,619,239 of Kotaki et al., issued April 8, 1997, the contents of which are hereby incorporated by reference. Nothing herein

1 should be construed as an admission of the validity or scope of the '239 patent. Rather, the
2 present invention presents an alternative design.

3 The '239 patent discloses a camming shoe (denoted as component 105a) having a
4 horizontal pressing means 105b. The pressing means (denoted as component 105b) generates a
5 downward force to press down onto the ink container. While the system disclosed in said patent
6 may (or may not) have a certain level of functionality or advantages in comparison with other
7 systems, it has been discovered that it is unnecessary for the ink cartridge to engage the camming
8 shoe in order to effectively seat within the printhead. The present invention relates to that
9 discovery.

10 The terminology employed herein is not necessarily the same as in the '329 patent.
11 Herein, the "cartridge" is the replaceable, removable ink storing member that fits within the
12 "printhead"—the term cartridge herein generally refers to term "ink tank" in the '329 patent.

13 BRIEF DESCRIPTION OF THE DRAWINGS

14 FIG. 1 is a perspective view of an embodiment of the present invention situated within a
15 printhead, fully engaged.

16 FIG. 2 is a perspective view of an embodiment of the present invention shown within the
17 printhead, before it is fully engaged.

18 FIG. 3 is a perspective view of an embodiment of the present invention shown without
19 the printhead.

20 FIG. 4 is a top view of an embodiment of the present invention, shown within the
21 printhead.

22 FIG. 5 is a front elevation view of an embodiment of the present invention.

FIGs. 6, 7, and 8 are section views taken respectively along the lines A-A, B-B, and C-C of FIG. 4.

DETAILED DESCRIPTION OF THE INVENTION

The invention relates to a number of features in a printer cartridge intended for use in an ink jet printer, although the invention is not limited to any particular field of use. The cartridge is described in overview, and then more particular aspects of the invention are described.

Referring to FIG. 1, the base 1 defines the boundary of the black ink cartridge (in conjunction with lid 2), and is profiled to mechanically key into a mating printhead 5 so that ink can be withdrawn from the ink chamber within the cartridge into the printhead. The lid 2 is hermetically sealed with the base, and through suitable vent means provides a pathway for communication of the ink chamber with the atmosphere. As explained below, the surface of the lid is provided with two features dimensioned to engage the printhead and create downward pressure of the cartridge onto the printhead nozzle openings.

The base 3 defines the boundary of the tri-color ink cartridge (in conjunction with lid 4). For the purpose of this invention, the base 3 and lid 4 are precisely analogous to base 1 and lid 2, and therefore require no separate elaboration.

FIG. 2 shows the black ink cartridge and the tri-color cartridge partially inserted into the printhead 5. That is, the cartridges have been placed in the printhead 5 but have not fully engaged the printhead, and there is no downward force. The cartridges are not operable in this placement because air would be aspirated into the printhead nozzles, which would lead to print failure.

FIG. 8 shows a section view of the black ink cartridge and tri-color cartridge after they have been fully inserted within the printhead 5. This view illustrates the engagement of the

1 black ink cartridge and tri-color cartridge with the printhead 5. As can be seen, the lid 2 has a
2 primary surface that does not contact the camming shoe (denoted 5a) of the printhead 4, so there
3 is a clear space therebetween. As can be seen, the camming shoe comprises a series of vertically
4 spaced tabs which extend downward from the interior surface of the top of the printhead, denoted
5 5b. Instead, the features 2a contact the interior surface 5b of the top of the printhead 5. As
6 shown in the drawings, the features 2a are offset from the spaced tabs 5b and have a sufficient
7 length to contact surface 5b. The black ink cartridge is sized so that engagement of the features
8 2a with the surface 5b causes a press fit of the cartridge within the printhead 5, therefore
9 allowing proper printing to occur.

10 In connection with the tri-color cartridge, features 4a engage the surface 5b in exactly the
11 same manner as the features 2a, providing the same benefit and allowing a clear space to exist
12 between lid 4 and the camming shoe 5a.

13 It will be appreciated that a number of features of the cartridge have been described
14 above, and that not every feature need be incorporated into any particular embodiment of the
15 invention disclosed herein. Further, the scope of any claims arising from this application shall be
16 limited only by the scope and content of the prior art. As contemplated, the present invention
17 includes a printer cartridge as described herein alone or in combination with a printhead.